

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2018

ELECTRICAL POWER UTILISATION

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. List properties of a good heating element.
2. What are the applications of dielectric heating ?
3. List major parts of an electric drive.
4. Define schedule speed.
5. Select the type of electric braking suitable for machine tools. (5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Explain high frequency eddy current heating method.
2. Describe seam welding process.
3. List major applications of electrolysis.
4. What is a group drive ? List advantages of group drive.
5. Compare the Speed - Time curves of a main line service and sub urban service.
6. What is tractive effort of a train ? Write expression for total tractive effort.
7. Name the DC motor used for traction purpose. Explain its suitability for traction.

(5×6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

- III (a) With the help of neat sketch explain the working of coreless type induction furnace. 8
- (b) What are the industrial applications of induction heating ? 7

OR

- IV (a) Explain the principle of dielectric heating. 7
- (b) With neat diagram explain butt welding process. 8

UNIT — II

- V (a) What is a multi motor drive ? List advantages and disadvantages ? 8
- (b) Explain advantages of electric drives. 7

OR

- VI (a) Explain what happens when electric current is passed through copper sulphate solution. 9
- (b) List applications of electric drives. 6

UNIT — III

- VII (a) Derive the expression for energy output from driving axle of an electric train. 9
- (b) A suburban train run with an average speed of 36 km/h between two stations 1.8 km apart values of acceleration and retardation are 1.8 km/h/s and 3.6km/h/s respectively. Calculate the maximum speed of the train assuming trapezoidal speed-time curve. 6

OR

- VIII (a) Sketch the simplified speed - time curve and hence derive the expression for crest speed. 8
- (b) An electric train has an average speed of 42 kmph on a level track between stops 1400m apart. It is accelerated at 1.7km/h/s and braked at 3.3 km/h/s. Draw the speed-time curve for the train indicating values of maximum speed, acceleration, free running and braking periods. 7

UNIT — IV

- IX (a) Describe various methods of electric braking. 9
- (b) List advantages of electric braking. 6

OR

- X (a) State desirable properties of traction motors. 8
- (b) Explain regenerative braking scheme of DC shunt motor. 7